

CLAIMS:

1. A process for preparing a concentrated milk protein ingredient which comprises the steps of:

providing a solution having a kappa-casein containing milk protein which is a membrane filtration retentate,

adjusting the divalent ion content of a said protein solution to a predetermined level at which no substantial gel is formed after treatment with a milk clotting enzyme,

adding a food grade milk clotting enzyme under reaction conditions appropriate to convert said kappa-casein to para kappa-casein while maintaining a solution,

deactivating or removing said enzyme to terminate said conversion, and

concentrating said solution.
2. The process of any one of the preceding claims, wherein other proteins are added to or are present in said milk protein solution.
3. The process of claim 2, wherein said other proteins are added to said milk protein solution prior to adjusting said divalent ion content.
4. The process of any one of the preceding claims, wherein said divalent ion is the calcium ion.
5. The process of any one of the preceding claims, wherein said divalent ion content is adjusted by cation exchange using a food grade cation exchanger.
6. The process of any one of claims 1 to 4, wherein said divalent ion content is adjusted by the addition of a food grade source of a monovalent cation.
7. The process of claim 6, wherein said monovalent cation is potassium, sodium or hydrogen.
8. The process of any one of the preceding claims, wherein said food grade enzyme is rennet.

9. The process of any one of the preceding claims, wherein said divalent ion content is reduced by at least 25% from that in skim milk.
10. The process of any one of the preceding claims, wherein said divalent ion content is reduced by at least 30, 40, 50, 60, 70, 80, 90 or 100% from that in skim milk.
11. The process of any one of the preceding claims, wherein said kappa-casein is converted to para kappa-casein at a pH in the range 4.5 to 7.5 at a temperature in the range 0 to 70°C.
12. The process of claim 11, wherein said conversion is at a temperature of 10, 20, 30, 40, 50 or 60°C.
13. The process of any one of the preceding claims, wherein fat or edible oil is added to said milk protein solution.
14. The process of claim 13, wherein said fat is cream.
15. The process of claim 13, wherein said fat is milk fat.
16. The process of any one of the preceding claims, wherein said milk protein is made from whole milk.
17. The process of any one of the preceding claims, carried out as a batch process.
18. The process of any one of claims 1 to 16, carried out as a continuous process.
19. The process of any one of claims 1 to 16, carried out as a combination of a batch and a continuous process.
20. The process of any one of the preceding claims, which includes the additional step of heating said concentrated solution to form a processed cheese.
21. The process of claim 20, which includes the step of combining said concentrated solution with cheese making ingredients prior to or during said heating step.

22. The process of any one of claims 1 to 19, which includes the additional step of drying said concentrated milk protein solution.
23. The process of claim 22 which includes the additional step of rehydrating said dried solution with hot water and blending to form a cheese.
24. The process of claim 23, wherein said water is heated before blending.
25. The process of claim 23, wherein said water is heated during or after blending.
26. The process of any one of claims 23 to 25 wherein said water is heated to between 30°C and 100°C.
27. The process of any one of claims 23 to 26 wherein said rehydrating water contains calcium.
28. An ingredient prepared by the process of any one of claims 1 to 19, 22 and 23.
29. A cheese prepared from an ingredient as defined in claim 28.
30. The cheese of claim 29 which is a processed cheese.
31. The processed cheese of claim 29 which is a cheese spread.
32. The process of any one of the preceding claims which includes the preliminary step of subjecting a milk to membrane filtration and recovering the milk protein retentate thereby formed.
33. The process of claim 32 wherein said membrane filtration is ultrafiltration.
34. The process of claim 33 wherein said ultrafiltration includes diafiltration.